

3. The summit of the mountain has been lowered and flattened.

An examination of the lava of 1872 does not appear likely to lead to any new results. Its mineralogical nature is essentially the same as that of the other lavas of all ages that have been found both on Vesuvius and in La Somma. It is composed of a leucitic rock strewn with crystals of augite, and destitute of vitreous felspar; whence the names of leuciferous or augitiferous, as one or other substance prevails. The most ancient lava which forms the body and crevices of La Somma, is in general very pale; it often contains an abundance of leucite crystals of the size of a foot; but its composition is, qualitatively, essentially analogous to that of the actual black lava. The lava of 1872 differs considerably in its physical appearance from that of 1858. The last is much less scoriated; it has a fleecy surface formed of round embossments, shining and comparatively little roughened. We might liken it to black whipped cream, which has flowed along, forming arches, fibrous stalactites twisted cords, which look at places as if vitrified. The lava of 1872, on the contrary, is extremely scoriaceous, and assumes a form almost like madrepore. On account of the great shrinking of the material, it has been broken up into blocks, entirely separated from each other, and roundish, because the mass was as yet vitreous; porous, in consequence of the quantity of gas it enclosed, and full of the most curious irregularities resembling coral and vegetation, which render progress infinitely difficult. The difference of appearance, combined with a thin layer of gray cinders which adheres to the lava of 1872, enables one to distinguish at once between it and those of preceding years. It will be noticed also to the north of the Observatory that the current has filled all the bottom of the valley of Ventrana, while on the south it has only run into the crevices of the old lava, surrounding the knolls, separating, re-uniting, leaving here and there inlets, as rivers without any determinate bed do at low water. This difference of structure of the two lavas seems to result from the very rapid cooling of that of 1872.

It is not easy to form a notion of the depth of this lava. In the lower parts the bed is about eight metres deep, with a breadth of about 800 metres; its borders form moraines of 45°, which indicate the small fluidity of the matter at the time it reached the place. In Atrio del Cavallo the moraine of the bed of lava which leans against the foot of the rocks of La Somma is less elevated, but the enormous waves in the middle of this surface argue in some places a considerable thickness.

The successive eruptions which have taken place in Atrio and which have piled up layer on layer, have enormously raised the level of the ground. A German geologist has conceived the idea of counting the layers which form the vertical dykes on the rocks of La Somma. At present the number would be hidden beneath more than a hundred feet of lava. The stream which debouches from Atrio has ended by considerably overtopping the Observatory; and that the latter has not been threatened this year results from the fact that the saddleback of Monte Canteroni, upon which it stands, rises in the direction of Vesuvius in such a manner that its eastern extremity (Croce del Salvatore) has hitherto performed the

part of a buttress in dividing the burning stream and diverting the two currents into the ravines which slope rapidly to the right and left of the height. But a new outbreak will, without doubt, sweep away the eastern extremity of this crest, and a succeeding one would easily be able to send a stream of lava flowing as far as the Observatory. Foreseeing this danger, M. Palmieri has raised above the building a redan of a very sharp angle. This will form but a weak barrier, though it may be able to retard for a little the progress of the devastating element. Since several of the recent eruptions have happened on the Atrio side, it would seem as if the chief centre of volcanic action was tending towards that point, and there seems little doubt that one of the next eruptions will place the Observatory more or less in danger. Let us hope, however, that when that time arrives a worthy successor of Palmieri may safely chronicle what is going on, and that another De Saussure may be there to see.

WAGNER'S HANDBOOK OF CHEMICAL TECHNOLOGY

A Handbook of Chemical Technology. By Rudolph Wagner, Ph.D. Translated and edited from the eighth German edition, with extensive additions by William Crookes, F.R.S. (London: J. and A. Churchill, 1872.)

EVERY one who has studied chemistry from a scientific point of view must have been more or less struck with the fact that nearly all our manuals of chemistry have much of their space occupied with detailed descriptions of various manufacturing processes, and many must have asked why this is. It is not easy to see what utility there is in describing, in works professedly devoted to a scientific subject, such processes as those for the manufacture of chamois leather, wine, vinegar, china and earthenware, &c. &c.; and yet our largest and most ambitious manual, in common with its smaller companions, devotes scores of its pages to the consideration of such subjects. This fashion is much to be deprecated for many reasons: in the first place, these processes are utterly useless to the student, as, in the majority of cases, they illustrate no rule, elucidate no reaction. In the second, it is utterly impossible to do full justice to them in the space to which they must perforce be confined; and in the last, much valuable matter about the rarer elements and reactions is squeezed out of place altogether, or passed over with a mere mention.

This system has borne its natural fruit in the numberless questions bearing on manufactures which are to be found in all our chemical examination papers; and the result is, that many a man passes with credit on the marks gained by answering such questions, while others who, perhaps, have a much better knowledge of the science, fall behind in the race, because they have not devoted their time to Technology.

It is not difficult to see how this state of things arose. It is not so many years (we were almost going to say months), since chemistry was regarded by the public much in the same way that they now look upon the higher mathematics, as something very mysterious, very good for a learned man to know—but utterly useless and “unpractical” for all ordinary purposes. Such being the

case, writers of manuals no doubt felt it incumbent on them to gild the pill by introducing such matter as tended to show that there was such a thing as a practical application of chemistry to the Arts.

However, that time has passed. Perhaps no science has of late become so widely popular, and certainly none has advanced so rapidly towards accuracy as chemistry. It is, therefore, time for it to throw aside the crutches upon which it was bound to support itself whilst struggling for recognition and public favour, and to march boldly forward, depending on itself alone. As a means to this end, it is with great pleasure that we welcome Mr. Crookes's translation of Dr. Wagner's work. He has given us, in the form of a handbook, what could only before have been obtained either by searching in special treatises, or by reading much more cumbersome dictionaries; and the existence of this book cannot but have its influence in setting free much of the space hitherto occupied in educational works on chemistry, by perfunctory descriptions of technological processes.

We most heartily join with Mr. Crookes in the hope he expresses at the end of his preface—"We cannot let this work pass out of our hands without expressing the hope that, at no distant date, chairs of Technology will be founded in all our universities, and that the subject will be included in the curriculum of every large school." Such an event could not fail to have the happiest effects on all; for, while it would set free the scientific student from a subject he does not require, it would enable those wishing to become managers of works or manufacturers, to study their special subjects in the best possible way."

The work consists of 745 closely-printed pages, with 336 illustrations, and a copious index. The subjects are treated at considerable length, and with extreme lucidity; this is especially the case with the portions devoted to metallurgical processes, where every step is carefully traced, and all the latest forms of furnaces, &c., are represented by woodcuts. We notice, however, that the section on electro-metallurgy is shorter than could have been wished, and that no mention is made of the process of depositing nickel upon iron, &c.

In the section on explosive compounds, we have full details for the preparation of picrates, nitro-glycerin, gun-cotton, &c.; though the author, perhaps led away by his chemical enthusiasm for these bodies, has treated gun-powder somewhat shortly, and the very interesting results obtained by the use of pebble, pellet, and prismatic powders, we do not see noticed at all; in fact, this article is decidedly behind the times. The preparation of salt, sulphur, soda, ash, bleaching-powder, &c., are well and fully treated, though we do not see Deacon's process for the preparation of chlorine mentioned.

The articles on glass and earthenware are remarkably good and full, as are those on cements and lime, paper, sugar, and spirit. Since March 1868, two editions of the work have been issued, making eight in all. Of the eighth, and last, translations have been made into French and Dutch, and everyone will thank Mr. Crookes for the quantity of new matter he has added. In conclusion, it need only be said that the formulæ are throughout molecular, and that the metric system of weights and measures is used, except where English quantities were indispensable. We feel sure that this book will permanently take its place among

our manuals, and that the editor and translator will, in future editions, correct any little faults and errors which are, in so large a work, unavoidable; while he will keep it fully abreast of the times.

R. F.

OUR BOOK SHELF

Ueber die Bedeutung der Entwicklung in der Naturgeschichte. Von Dr. A. Braun, Berlin.

Ueber die Auflösung der Arten nach natürliche r Zuchtwahl. Von einem Ungenannten, Hanover. (London: Williams and Norgate.)

THESE are two of the most recent of the numerous contributions which Germany has made to the literature of Darwinism. The first is an address delivered on the anniversary of the medical and surgical Frederick-William Institute in Berlin, and is a tribute to the enormous impetus given to physiological research by the promulgation of Mr. Darwin's theories. The writer, however, while fully adopting the principle of Evolution, leans to the views which have during the last few years greatly spread among naturalists, that any theory like that of natural selection, which does not recognise an inherent law of progress, is insufficient to account for the phenomena of the transmutation of species.

The second of these pamphlets is a more noteworthy production. The anonymous author also admits the principle of Descent by Evolution, but contends that the carrying out of this principle, so far from leading, as is generally supposed, to a multiplication of species and to a gradual rise to more and more perfect organic forms, must necessarily result in a gradual diminution in the number of species, a fusing together of form after form, and a descent to more lowly, instead of an ascent to more highly organised structures. With the origin of life he does not concern himself, but only with its future; and the succession of organised beings he compares not to a tree branching out into infinite ramifications, but to a river uniting in itself an infinitude of smaller streams. Whether the proposition is a serious one, or whether it is put forward as a *reductio ad absurdum* by a furtive opponent of Evolution, it is difficult to say; but the argument is carried out with considerable ability, and a strong point is made of the acknowledged degeneracy of many races of men from the condition of their ancestors, and of the gradual dying out of tribes and the consolidation of the human family into an ever decreasing number of types.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

The National Herbarium

You will, perhaps, give admission to a few remarks on Dr. Hooker's instructive "Reply" to my "Statement" of 16th May, 1872, bearing in mind that this "Statement" was called for in explanation of the grounds of my requirements and assignment of space in the Museum of Natural History, to be built at South Kensington, for the reception, uses, and applications of the National Herbarium, on the conviction that such would be continued and maintained in the metropolis.

Dr. Hooker had put in the van of his evidence,† and recommendations bearing on the reduction,‡ limited applications,§ and subordination to Kew ||, of the Herbarium at the British Museum

* See NATURE, vol. vi. p 516.

† Minutes of Evidence of Royal Commission on Scientific Instruction.

‡ Ans. to Q. 6,683.

§ Ans. to Q. 6,684 and 6,685

|| *Ibid.*